REMARKS

By this amendment, applicants have amended the claims 1, 4, 5, 8, 9, 12, 13, 14, 15, 16 and 17 to more clearly define their invention. In particular, Applicants have amended claims 1, 2, 4, 5, 8, 9 and 12-17 to recite that the network is a mobile network. These amendments are supported by, e.g., page 11, lines 16-17 of Applicants' specification. Claims 9 and 12 have also been amended to eliminate the informalities noted by the Examiner in numbered sections 1 and 2 of the Office Action. Claims 2 and 6 have been rewritten in independent form by including therein all of the limitations previously recited in claims 1 and 5, respectively. Claim 15 has been amended to depend from claim 14 and to recite that the mobile network comprises a plurality of sub-networks.

In view of the foregoing amendments to claims 9 and 12, reconsideration and withdrawal of the objections to these claims in numbered sections 1 and 2 of the Office Action are requested.

Claims 1, 3-5, 7-9 and 12-17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,905,871 to Buskens et al. Applicants traverse this rejection and request reconsideration thereof.

Buskens is concerned with providing a protocol, referred to as the "RMTP" protocol, that can be used when a continuous byte stream is transmitted and when there are requirements in terms of end-to-end delay and, at the same time, high reliability requirements. According to this aspect of the RMTP protocol, reliability may be compromised if the end-to-end delay requirements are not satisfied (see column 1, lines 29-36).

The RMTP protocol can also be used in applications, for example software distribution, that use a continuous byte stream, as opposed to a single file, for

transmission from a sender to multiple receivers. In this case, there are no strict requirements on end-to-end latency, but complete reliability is necessary (see column 1, lines 21-28 and 37-41).

As a solution to the reliability problem, Buskens provides a system which includes a multicast tree having routers that act as intermediate network nodes which connect a sender and a group of receivers. The multicasting system is divided into plural local groups. Each local group has plural receivers and one of the receivers is a Designated Receiver (DR). The DR is the representative of the local group. The DR receives ACKs on behalf of the group's members and informs the group's condition to a second collectively, or re-transmits data to a group members who have not receive the data on behalf of the sender (column 3, lines 6-12 and 50-56). Thus, Buskens provides a solution to the reliability problem.

The present application is concerned with providing an improved method of multicasting. In particular, the present application is concerned with ameliorating the problem of a sender being swamped with responses from each receiver that indicate whether the receivers has correctly received initial transmitted data; the so-called "implosion" problem. The implosion problem results in overload of processing overhead at the sender, delay in data communication and loss of messages.

The present application also seeks to avoid the problem of receivers that are assigned to serve a local group of receivers being forced to retransmit data over low-capacity or unreliable links, such as radio links in a mobile network, since this can result in slow recovery.

An example of a multicast system is described comprising a mobile network, a sender and a plurality of mobile terminals which form a multicast receiver group. The sender multicasts data to the mobile terminals. If the mobile terminals receive

packets of data with errors, then they return a state of reception message. Routers within a sub-network are chosen as controllers depending on the state of reception messages. The routers may be implemented in dedicated hardware or in PCs. The controllers manage recovery for a group of mobile terminals. The group of mobile terminals, together with routers linking them to the controllers, is known as a local group and the controller in charge of recovery is known as the local group controller. Each controller carries out retransmission for its local group.

The application differs from Buskens in that the application discloses that, in a mobile network, the local group controller is a router and that the router sends or receives data on behalf of the receivers in the local group.

One advantage is that recovery is managed locally by a router within the network rather than by the sender or the receiver, thus ameliorating the problem of implosion at the sender and reducing sensitivity to the quality of the network links to the receiver.

Another advantage is that the local group controller is a router, which does not move. In a mobile network, the local group controller could be a mobile device which could move out of range of the local group. If the local group controller moved out of range of its local group, then re-transmission in its local group would fail. Thus, it would be possible that local re-transmission could fail if the local group controller were a mobile device.

Furthermore, if the local group controller were a mobile device, its circuit could deteriorate or even fail. In this case, data could not be processed in its local group. Additionally, a router performs comparatively better than a mobile device. Thus, it is both more efficient and more reliable that the local group controller is a router, as opposed to a mobile device.

Buskens does not describe a mobile network (see column 3, lines 4-6). Furthermore, Figure 1 shows a network, but does not give any indication that the network is a "mobile" network, for example by showing a receiver moving between local regions or by showing radio links. Thus, we consider that Buskens does not describe a mobile network.

A person of ordinary skill in the art would not have considered modifying the system disclosed in Buskens to be a mobile network because there are foreseeable problems with modifying Buskens in this way. For example, in a mobile network, a designated receiver would be a mobile device. Thus, it could move out of range of the local group, in which case re-transmission in its local group would fail. However, even if we assumed that a mobile device did not move out of range of the local group, the skilled person would appreciate that a mobile device would be less efficient and less reliable as a designated receiver than a router.

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all of the claims now in the application are requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case:1076.40361X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP

Alan E. Schiavelli
Registration No. 32,087

AES/at
(703) 312-6600